Eng. Lib
6 QR

# MACHINE DESIGN

## *Index to Volume 6*

*January to December, 1934*

*The Johnson Publishing Co., Cleveland*

# MACHINE DESIGN

# GENERAL CONTENTS INDEX

## January to December, 1934

*For Itemized Index, See Page 12*

---


**A**

**Air Conditioning:**

Advances in, Aug., pp.39, 40.
Interest in, March, p.41.
Refrigeration cycle, reversing, March, p.20.

**Aircraft:**

Autogiros, refinement of, Jan., p.48; Dec., p.56.
Chance Vought, memorial to, Dec., p.56.
Engines, compact arrangement of, Aug., p.19.
Factor of safety in, Oct., p.44.
Liberty engines, abandonment of, March, p.40.
Military, strength of, April, p.39.
Noise levels in, Aug., p.40.
Official, coloring of, Aug., p.39.
Paddle type, description of, March, p.41.
Piloting automatically, Dec., p.56.
Propellers, adjusting, Feb., p.19; Sept., p.23.
Rotor type, discussion of, Aug., p.40.
Safety in, enhancing, Dec., p.52.
Steam engines for, Jan., p.19.
Transoceanic service, proposals for, Nov., p.48.

**Alloys:**

*See also under Materials.*

Cutting weight with, April, p.15.
Developments in, Oct., p.35.
Effect of, in steel, June, p.39.

**American Foundrymen's Association:**

Annual meeting, report on, Nov., p.36.

**American Gear Manufacturers Association:**

Gear materials discussed by, June, p.33.
Meeting of, discussion of, Nov., p.48.

**American Oil Burner Association:**

Exposition of, April, p.39.

**American Safety Council:**

Discussions of, report on, Dec., p.48.

**American Society for Metals:**

Annual meeting, report of, Oct., p.35.

**American Society of Heating and Ventilating Engineers:**

Exposition of, March, p.41.

**American Society of Mechanical Engineers:**

Annual meeting, report of, Jan., p.24.
Effect of temperature on properties of metals, Sept., p.41.
Findings of, Feb., p.42.
Lubricants, classification of, March, p.41.
Pressure and vacuum gages, standards for, Dec., p.52.

**American Society of Testing Materials:**

Activities of, April, p. 39.
Effect of temperature on properties of metals, Sept., p.41.

**American Standards Association:**

Advisory committee, additions to, Sept., p.41.
Electric welding standards, March, p.40.
Membership increase of, Aug., p.39.
Soviet Union, co-operation with, Oct., p.44.
Tapered roller bearings, recommended sizes for, Oct., p.44.

**Automobiles:**

Aluminum pistons, hardening surface of, Dec., p.21.
Bumpers, use of spare tire for, May, p.24.
Design of, problems in, July, p. 28.
Engine ignition timing, Sept., p.42.
Heaters for, design of, Nov., p. 20.
Hydraulic transmissions for, April, p.19.
Influence of, on tractor design, May, p.24.
Latest designs in, Jan., p.13.
Leaf springs, developments in, June, p.27.
New models, introduction of, Nov., p.50.
Piston pins, combating wear in, July, p.30.
Rear engines, trend to, Dec., p.21.
Sealed cooling, use of, Oct., p. 46.
Starters for, developments in, June, p.32.
Steel, use of, in, Dec., p. 52.
Tappets, spring arrangement on, May, p.25.
Transmissions, providing overdrive for, Sept., p.22.
Wheels, springing of, Dec., p. 21.

**B**

**Balancing:**

High speed machinery, Feb., p. 13.

**Bearings:**

*See also under Parts in Itemized Index.*

Ball,
flanged, announcement of, Jan., p.49.

self-aligning, announcement of, Aug., p.47.
shielded, announcement of, May, p.64.
snap ring type, announcement of, Sept., p.54.
with grooveless outer races, application of, Aug., p.19.
Bronze, high-leaded, steel-backed type, Oct., p.20.
Bronze stock, announcement of, May, p.64.
Design of, with shaftless motors, Oct., p.23.
Journal type, reaching limits in, Dec., p.15.
Maintaining position of, Feb., p.15.
Materials for, discussion of, July, p.28.
Needle type, announcement of, April, p.50; Sept., p.52; Dec., p.60.
Phosphor bronze stock for, announcement of, Aug., p.48.
Pillow blocks, cork insulated, announcement of, Nov., p.60.
Roller,
mountings for, announcement of, July, p.68.
oversize, use of, Jan., p.27.
tapered type, simplified practice recommendations for, Sept., p.42; Oct., p.44.
use of, on observatory dome, Aug., p.15.
Rotation of, preventing, March, p.63.
Sealed and shielded types, applications of, Aug., p.22.
Shaft mountings, Sept., p.44.
Supporting properly, March, p.26.
Thrust alleviated by, March, p.21.

**Belting:**

*See also under Drives in Itemized Index*

Dual ply, announcement of, April, p.56.
Motor drives, discussion of, July, p.32.
Rubber, endless type, announcement of, Sept., p.58.
Tension, increasing, Sept., p.43.

**Biographical Sketches:**

Anderegg, Reuben H., June, p.51.
Boeing, William Edward, Oct., p.48.
Bommer, Ferdinand J., Jr., Feb., p.39.
Burr, Walter H., Dec., p.43.
Chapman, Everett, April, p.40.
Chase, Henry M., Nov., p.44.
Christensen, John, June, p.51.
Daney, Norman L., Jan., p.43.
deForest, Alfred V., Oct., p.48.
Dohner, Donald R., June, p.51.
Eaton, Wyman, March, p.42.
Enger, Prof. Melvin L., July, p.41.
Farmer, F. M., Feb., p.39.
Flanders, Ralph E., Aug., p.41.
Hall, Prof. James A., Jan., p.42.
Harrison, Robert E. W., May, p.44.
Haynes, Charles V., April, p.40.
Herron, James Hervey, Aug., p.41.
Horton, William M., April, p.41.
Hunt, Andrew D., Oct., p.48.
Jacobs, Eastman N., April, p.41.
Jacobus, Dr. D. S., July, p.41.
Johnson, Eads, March, p.43.
Johnson, Joseph A., Feb., p.38.
Johnston, Edward A., Sept., p.39.
Kennelly, Dr. Arthur E., March, p.42.
Kurtz, Henry, Sept., p.39.
Lincoln, John C., Nov., p.44.
Rumely, William N., Feb., p.38.
Stevenson, Alexander R., Jr., Jan., p.43.
Stillwell, Lewis B., May, p.44.
Stilwell, Charles J., Dec., p.43.
Sykes, William E., July, p.41.
Templin, Richard L., Aug., p.41.
Tullar, C. E., Dec., p.43.
Westcott, Harry R., Sept., p.39.
Williard, Arthur C., May, p.44.
Wills, C. Harold, March, p.43.
Wolf, Austin M., Nov., p.44.
Youngren, Harold T., Jan., p.42.

**Books:**

"Applied Hydro and Aeromechanics," by O. G. Tietjens, Oct., p.33.
"Cost and Production Handbook," by L. P. Alford, Jan., p.23.
"Design and Use of Instruments and Accurate Mechanism," by T. N. Whitehead, June, p.35.
"Design of Machine Elements," by Virgil M. Faires, July, p.20.
"Die Castings," by Herbert L. Chase, Dec., p.45.
"Engineering Drafting," by William G. Smith, Dec., p.45.
"Fundamentals of Hydro and Aeromechanics," by O. G. Tietjens, Aug., p.26.
"Human Problems of an Industrial Civilization," by Elton Mayo, Jan., p.28.
"Industrial Radiography," by Ancel St. John and Herbert Isenburger, April, p.28.
"Inventions, Patents and Trade-Marks," by Milton Wright, Jan., p.23.
"Kinematics of Machines," by George L. Guillet, Aug., p.26.
"Machine Design," by Louis J. Bradford and Paul E. Eaton, June, p.35.
"Machine Drawing," by Eliot F. Tozer and Harry A. Rising, Oct., p.33.
"Machinery's Handbook," Edited by Erik Oberg and Franklin D. Jones, Dec., p.45.
"Plastic Molding," by Louis F. Rahm, June, p.35.
"Principles of Mechanism," by C. E. Pearce, Dec., p.45.
"Procedure Handbook of Arc Welding Design and Practice," April, p.28.
"Romance of Research," by L. V. Redman and A. V. Mory, Jan., p.28.
"Symposium on Cast Iron," Jan., p.23.
"The Economy of Abundance," by Stuart Chase, May, p.37.
"The Engineer's Sketch Book," by Thomas W. Barber, Oct., p.33.
"The Inventor and His World," by H. Stafford Hatfield, April, p.28.
"Theory of Elasticity," by S. Timoshenko, July, p.20.
"Trevithick, the Engineer and the Man," by H. W. Dickinson and Arthur Titley, Sept., p.32.
"1933 Book of A.S.T.M. Standards," Jan., p.28.
"1934 A.S.H.V.E. Guide," April, p.28.

**Brakes:**

Electric, announcement of, Dec., p.58.
Electrical regenerative system, Jan., p.19.
Electromagnetic, design of, Aug, p.46.
Solenoid operated, announcement of, Sept., p.50.

**Business:**

Announcements, Jan., p.65; Feb., p.65; March, p.65; April, p.65; May, p.73; June, p.89; July, p.73; Aug., p.65; Sept., p.65; Oct., p.73; Nov., p.73; Dec., p.73.
How Is?, Jan., p.45; Feb., p.46; March, p.46; April, p.42; May, p.43; June, p.68; Aug., p.44; Sept., p.48; Oct., p.56; Nov., p.52; Dec., p.50.

**C**

**Cams:**

*See also under Mechanisms in Itemized Index.*

Adjustable type, discussion of, Nov., p.56.
Employment of, Feb., p.44.

**Capacitors:**

Dust-tight, announcement of, Jan., p. 59.

**Castings:**

Alloy steels, properties of, Oct., p.36.
Gray iron, use of copper in, March, p.41.
High chromium irons, discussion of, Nov., p.36.
Iron, dampening effect of, May, p.42.
Producing, centrifugally, July, p.62.
Steel, discussion of, Nov., p.68.

**Chains:**

*See also under Drives in Itemized Index.*

Conveying, use of, Dec., p.35.
Conveying type, improvements in, Aug., p.30.
Redesigned, for appearance, announcement of, Sept., p.50.
Severe drive conditions, combating with, June, p.36.
Stainless steel, announcement of, June, p.74.
Stoker, use of, in, March, p.26.
Textile machine, use of, in, July, p.18.

**Clutches:**

*See also under Drives in Itemized Index.*

Automobile, developments in, Jan., p.13.
Friction type, announcement of, Jan., p.58; Sept., p.56.
Hydraulic type, discussion of, Sept., p.37; Oct., p.41.
Magnetic, announcement of, March, p.57; May, p.62.
Magnetic, use of, in lathe, Jan., p.18.
Mechanical type, announcement of, July, p.66.
Overrunning, announcement of, May, p.58.
Plate type, announcement of, March, p.53.
Resilient type, May, p.26.
Rolling action, securing in, Feb., p.17.

**Compressed Air:**

Materials handling, use of, for, July, p.22.
Welders, use of, in, Feb., p.24.

**Compressors:**

Centrifugal type, announcement of, Dec., p.62.

**Conduit:**

Explosion proof, announcement of, March, p.56.

**Contributors:**

Abbott, E. J., May p.31.
Arentzen, E., Dec., p.35.
Ayres, Arthur, Feb., p.13.
Banner, Otto A., Aug., p.37.
Barish, B. W., June, p.45.
Betz, William C., Aug., p.38.
Brown, O. E., April, p.37.
Bruhl, Paul C., Oct., p.41.
Buckingham, Earle, June, p.62.
Burrell, E. P., Aug., p.15.
Candee, A. H., July, p.52.
Carpenter, John S., May, p.34; Oct., p.29; Dec., pp.28, 41.
Chamberlain, J. M. W., June, p.23.
Clark, Allen F., Jan., p.20; Feb., p.30; March, p.26; May, p.27; June, p.29; July, p.30; Aug., p.22; Oct., p.22; Nov., p.24; Dec., p.22.
Cone, Edwin F., Dec., p.31.
Davis, R. L., Jan., p.33.
Dexter, H. B., May, p.42; Aug., p.25; Dec., p.15.
Elmendorf, M. W., March, p.15.
Fenno, J. E., Feb., p.37; March, p.39; Sept., p.38; Nov., p.41; Dec., p.41.
Flodin, John, Jan., p.39.
Forbes, A. W., May, p.41.
Hamm, H. W., Sept., p.37.
Hammer, T. F., May, p.42.
Hankin, Edward K., Feb., p.20.
Harrington, Joseph, Jr., Jan., p.29.
Henny, J. C., Oct., p.30.
Hoffman, Paul, Jan., p.25.
Hofmann, Max, March, p.33.
Holloway, T., June, p.89.
Holmes, R. E., Oct., p.15.
Jauch, R. J., May, p.19.
Jermy, L. E., March, p.30; June, p.36; Aug., p.30.
Johnson, L. A., March, p.39.
Kinkead, Robert E., May, p.41.
Kligman, A. R., April, p.26.
Ludwig, C., Oct., p.42; Nov., p.41.
Maloney, T. J., March, p.22.
Marthens, R. S., July, p.54.
McCall, M. M., Oct., p.26.
Michelson, J., Oct., p.41.
Morey, Carl, May, p.32.
Mory, A. V. H., April, p.22.
Parkhill, J. R., Nov., p.41.
Peterson, R. E., Dec., p.25.
Piper, E. L., Sept., p.29.
Powell, C. H., May., p.23.
Rah, Joseph C., Oct., p.42.
Ramsey, C. H., July, p.17.
Ross, A. A., June, p.61.
Roy, R. L., Nov., p.42.
Sayre, M. F., Sept., p.24; Nov., p.31.
Schirmer, C. E., April, p.37.
Schmitter, W. P., June, p.40; July, p.33, p.56.
Scott, Henry T., April, p.15.
Shepherd, Harold F., Feb., p.37.
Short, Ira, July, p.52.
Smith, S. A., Aug., p.37.
Stock, Arthur J., June, p.45.
Sykes, W. E., June, p.61.
Veith, Harold B., Jan., p.24; Oct., p.34; Nov., p.27.
Wahl, A. M., Dec., p.25.
Weaver, E. W., June, p.31.
Wojcik, J. S., Nov., p.22.
Wolf, Austin M., Jan., p.13; Oct., p.42.
Woodling, George V., Jan., p.39; April, p.29; July, p.24; Sept., p.15; Nov., p.15.

**Controllers:**

Current and water, balancing, April, p.46.
Diesel engine, perfecting, March, p.34.
Liquid level, announcement of, April, p.59.

**Controls (Electrical):**

*See also under Parts in Itemized Index.*

Breakers, announcement of, May, p.60.
Centrifugal switch, application of, July, p.19.
Design of, for can-making machine, Oct., p.54.
Motor operators, announcement of, Feb., p.58.
Observatory, regulating, Aug., p.18.
Push buttons, announcement of, April, p.54.
Relays, announcement of, Feb., p.60.
Relays, for cranes, announcement of, April, p.59.
Solenoids, for regulation, April, p.20.
Starters,
dust-tight, announcement of, Aug., p.52.
magnetic, announcement of, March, p.58.
safety type, announcement of, Sept., p.50.
solenoid type, announcement of, March, p.52.
Switches,
dust-tight, announcement of, Feb., p.54.
explosion proof type, announcement of, Aug., p.47.
hand operated, announcement of, Oct., p.62.
indoor disconnecting type, announcement of, Sept., p.59.
industrial, announcement of, March, p.58; Sept., p.55.
mercury type, announcement of, April, p.56.
timing, announcement of, Feb., p.58.
vacuum type, announcement of, Oct., p.60.

Timers, electric, announcement of, April, p.52.
Timing contactors, announcement of, Jan., p.52.
Variable speeds, obtaining with, Feb., p.30.

**Converters:**

Inverted type, announcement of, June, p.74.
Small, announcement of, June, p.76.

**Conveyors:**

Chain type, announcement of, Sept., p.55.
Laterally flexible, design of, Dec., p.35.
Rollers for, March, p.63.
Special conditions, meeting with, Dec., p.35.
Transferring, between, June, p.66.

**Couplings:**

*See also under Parts in Itemized Index.*

Flexible, announcement of, July, p.65; Nov., p.66.
Geared type, announcement of, March, p.54.
Hydraulic type, description of, Dec., p.30.
Rubber type, flexible, announcement of, Jan., p.49; April, p.52.
Sprocket type, announcement of, Jan., p.50.

**D**

**Design Calculations:**

*See Itemized Index.*

**Design Department:**

*See also in Itemized Index.*

Blueprinting machine, announcement of, July, pp.68, 69; Aug., p.59; Sept., p.58.
Calculations, simplifying, Jan., p.29.
Curves, determination of drop in, June, p.49.
Drafting machine, announcement of, Oct., p.65.
Drawing and drafting room practice, standardization of, Aug., p.27.
Drawing machine, announcement of, Feb., p.52.
Drawing tables, announcement of, June, p.76.
Drawing, reducing number of, Nov., p.22.
Drawings, tabulating, Aug., p.38.
Engineering, proper appreciation of, Aug., p.41.
Engineers, number of, and demand for, Nov., p.48.
Erasing machine, announcement of, March, p.50.
Graphs, use of, May, p.34.
Labor in, reducing, Jan., p.39.
Machine age, discussion of, May, p.37.
Moments of inertia, determining, May, p.23.
Parts numbers, system of, March, p.15.
Patent contracts, perfecting, April, p.29.
Piece rate system for, May, p.32.
Relation to other departments, May, p.30.
Tabulated drawings, advantages of, Nov., p.22.
Threads, representation of, Oct., p.41.

**Designers:**

*See Design Department.*

**Design Features in New Machines:**

Pictorial presentation of, April, pp.34, 35; May, pp.38, 39; June, pp.46, 47; July, pp.38, 39; Aug., pp.34, 35; Sept., pp.34, 35; Oct., pp.38, 39; Nov., pp.38, 39; Dec., pp.38, 39.

**Die Castings:**

Brass and aluminum bronze, employment of, Nov., p.24.
Employing, Jan., p.33.
Increasing applications of, Jan., p.33.
Possibilities of, Nov., p.24.
Zinc, employing, May, p.19.

**Drives:**

*See also under Parts in Itemized Index.*

Applying in limited space, May, p.26.
Centrifugal force, utilizing in, Sept., p.22.
Combined turbine and reducer, announcement of, Feb., p.54.
Controlling with viscosity, Aug., p.19.

**Drives:**

Differential type, design of, Nov., p.20.
Friction, use of, for, Feb., p.15; Dec., p.46.
Gear sets, helical and herringbone, discussion of, June, p.40; July, p.33.
Hydraulic, announcement of, Feb., p.52.
Hydraulic, control of, Dec., p.28.
Infinite speeds, providing, Jan., p.20.
Pulley, variable speed, announcement of, March, p.57.
Rolling wedge, use of, for, Feb., p.18.
Sheaves, reinforced type, announcement of, Dec., p.58.
Tooth contact, maintaining, April, p.20.
Torque, converter, Sept., p.43.
Variable speed,
announcement of, May, pp.58, 67.
arrangement of, Nov., p.20.
for refrigerating, Dec., p.20.

**E**

**Editorials:**

Air Conditioning Coming to the Fore, Sept., p.36.
All Indications Point to Rapid Progress in Machinery Industries, June, p.48.
Best Design Is the One that Meets the Wishes of Most Customers, July, p.40.
Best Is Not Costliest! May, p.40.
Breadth of Experience Determines Capacity to Accept Opportunities, Oct., p.40.
Broader Aspects of Chief Engineers' Work Cover Research, Development, May, p.40.
Cannot Hazards to Life Be Combated by Improved Machinery? Aug., p.36.
Conditions Demand Broader Interests on Part of Engineers, Jan., p.36.
Development and Design Stand Best Chance in Subnormal Periods, Dec., p.40.
Fundamentals of Style, Dec., p.40.
Give and Take! Feb., p.34.
Good Appearance Goes Long Way Toward Reflecting Good Performance, Nov., p.40.
Keep In Touch! April, p.36.
Machine Noise Is Doomed! July, p. 40.
Materials Consciousness Is Increasing in Minds of Designers, Sept., p.36.
Minimizing Drafting Confusion, Aug., p.36.
Patents, Invention and Design Ingenuity Revitalized Under New Deal, March, p.36.
Proper Appreciation of Engineering Must Be Fostered, April, p.36.
Single or Combined Effort, Oct., p.40.
Style Cannot Replace Reliability, Jan., p.36.
Survey of Operating Conditions Is Essential During Design, Feb., p.34.
The Gap Narrows, March, p.36.
Utilize Technical Minds! Nov., p.40.
Watch Gearing Development! June, p.48.

**Electronic Devices:**

*See also under Parts in Itemized Index.*

Cutting regulators, announcement of, Aug., p.54.
Employment of, Oct., p.46.
Fog density, measuring with, Dec., p.56.
Industrial controls, announcement of, Aug., p.48.

Light sources, announcement of, March, p.56.
Relays, announcement of, March, p.55; April, p.60.
Safety, securing with, March, p.45.

**Engineering Department:**

*See Design Department.*

**Engines:**

Arrangement of, in aircraft, Aug., p.19.
Automobile, developments in, July, p.28.
Diesel type,
crankless, Feb., p.42.
developing the small, Aug., p.25.
experimental type of, July, p.43.
thrust control in, March, p.21.
starting of, Sept., p.21.
progress in, March, p.33.
Fuel sprays, investigating, Sept., p.46.
Gasoline, for refrigeration unit, Oct., p.19.
Ignition timing, Sept., p.42.

F

**Fastenings:**

*See also under Parts in Itemized Index.*

Cap screws, knurled-head type, announcement of, Sept., p.57.
Fine screws, avoiding, March, p.21.
Keways, discussion of, June, p.34.
Screws, differential and compound, determining efficiency of, April, p.25.
Socket screws, announcement of, Dec., p.64.
Speed nuts, application of, March, p.21.
Washers, aviation type, announcement of, Nov., p.64.

**Fatigue of Metals:**

*See Stresses.*

**Filters:**

Universal, announcement of, Dec., p.58.

**Finishes:**

*See also Itemized Index.*

Aluminum, announcement of, March, p.50.
Aluminum paint,
announcement of, Dec., p.62.
use of, in dairy industry, Nov., p.42.
Aluminum pistons, obtaining hard surface on, Dec., p.21.
Bright colors, employing, March, p.22.
Chromium plating, use of, for wear resistance, July, p.30.
Color, advances in, Oct., p.21.
Decalcomanias, specifying, Oct., p.34.
Nickel, announcement of, June, p.74.
Polished surfaces, composition of, April, p.24.
Prefinished sheets, possibilities of, Nov., p.27.
Surface roughness, determining, May, p.31.
Tin plating, applying, Sept., p.20.

**Flywheels:**

Hydraulic, for automobiles, April, p.19.

**Forces:**

Determining by phorograph method, Sept., p.24.

G

**Gages:**

Dial type, announcement of, June, p.70.
Pressure, announcement of, May, p.66.

**Gears:**

*See also under Parts in Itemized Index.*
Advances in, Nov., p.48.
Automobile, providing overdrive with, Sept., p.22.
Design of, for screw-cutting lathe, Oct., p.26.
Differential, applying, May, p.19.
Failures, considering causes of, June, p.44.
Flexible tooth, design of, July, p.22.
Helical and herringbone, analysis of, June, p.40; July, p.33.
Materials for, selection of, June, p.33; July, p.33.
Movement of, controlling, Aug., p.45.
Nature of service, adjusting for, July, p.44.
Pitting of, explanation of, Aug., p.37.
Rating of, June, p.40; July, p.33.
Reversing, June, p.64.
Selection of, June, p.40; July, p.33.
Tooth contact, maintaining, April, p.20.
Torque converter, use of, in, Sept., p.43.

**Governors:**

Pressure type, announcement of, Jan., p.52.

H

**Hard Facing:**

*See also under Materials in Itemized Index.*

Electrodes, announcement of, April, p.60.
Inserts, application of, June, p.29.
Rods, applying, May, p.27.
Types, classification of, June, p.29.
Valve inserts, applying, April, p.39.

**Heating Units:**

*See also under Parts in Itemized Index.*

Controlling, in textile machine, July, p.17.

**Human Element:**

Customers' desires, satisfying, Aug., p.29.
Efficiency, increasing with color, March, p.22.
Labor saving machinery, benefits of, Aug., p.43.
Motions, eliminating, Oct., p.19.
Operating conditions, studying, March, p.39.
Operators, considering, Jan., p.24; March, p.30; May, p.41.
Paint fog, eliminating, Aug., p.20.
Safety, insuring, March, p.30; Oct., p.30; Nov., p.28; Dec., p.48.
Silicosis, combating, March, p.32; April, p.39.

**Hydraulics:**

*See also under Principles in Itemized Index.*

Automobiles, use of, in, April, p.19.
Clutches, operation of, by, Sept., p.37; Oct., p.41.
Control devices for, Dec., p.28.
Infinite speeds, securing with, Jan., p.20.
Mechanisms, maintaining position by, Feb., p.46.
Thrustors, announcement of, Oct., p.58.
Utilization of, for propeller adjustment, Sept., p.23.

I

**International Acetylene Association:**

Discussions of, report on, Dec., p.52.

**Ideas:**

Scanning the Field for, Jan., p.17; Feb., p.17; March, p.19; April, p.19; May, p.24; June, p.26; July, p.21; Aug., p.19; Sept., p. 19; Oct., p.19; Nov., p.19; Dec., p.20.

**Instruments:**

Gages, pressure, altitude, feet, announcement of, March, p.52.

Micrometer heads, announcement of, Oct., p.58.
Thermometers, indicating type, announcement of, June, p.76.

**Invention:**

*See Noteworthy Patents; also Patents.*

**L**

**Light Sensitive Devices:**

*See Electronic Devices.*

**Lubrication:**

*See also Lubrication and Lubricating Equipment under Parts in Itemized Index.*

Automobile, discussion of, July, p.28.
Centralized systems, Oct., p.31.
Classification of lubricants, March, p.41.
Force feed lubricators, announcement of, Nov., p.64.
Gearing, rules for, July, p.44.
Journal type bearings, designing, for, Dec., p.15.
Oil, effect of, on workers, March, p.40.
Pressure gun, on observatory, Aug., p.15.

**Lubricating Equipment:**

*See Lubrication and Lubricating Equipment under Parts in Itemized Index.*

**M**

**Machinery:**

Acid pumps, protection of, June, p.23.
Air conditioning,
  design of, Oct., p.15.
  mechanisms of, April, p.21.
Broaching, review of, Feb., p.28.
Calculating, discussion of, Aug., p.39.
Can making, controlling, Oct., p.54.
Centrifugal casting, discussion of, July, p.62.
Centrifugals, design of, Feb., p.13.
Centrifuges, developments in, June, p.50.
Check protectors, improving appearance of, Feb., p.17.
Cloth shrinking, design of, July, p.17.
Coal loader, design of, Dec., p.35.
Coin-operated, design of, May, p.56.
Compressors, design of, Jan., p.25.
Computing pumps, design of, May, p.19.
Conveying, for dry materials, July, p.22.
Dairy, circulation of liquids in, June, p.27.
Developments in, survey of, Oct., p.44.
Dishwashing, design of, Nov., p.54.
Domestic, developing, May, p.36.
Feed grinding, developments in, Aug., p.46.
Grinder, improvements in, Sept., p.31.
Grinding, internal, May, p.25.
Industrial trucks, improving design of, Nov., p.28.
Internal centerless grinders, design of, March, p.20.
Juice extracting, discussion of, June, p.64.
Labor saving, economic effects of, Aug., p.43.
Lathe, operating automatically, Jan., p.18.
Observatory dome, motivating, Aug., p.15.
Paint spraying, design of, Aug., p.20.
Paper bottle, design of, April, p.15.
Paper winders, braking of, Jan., p.19.
Power shovels, simplifying operation of, Oct., p.19.
Purchases of, by Germany, Oct., p.46.
Refrigeration, gasoline powered, Oct., p.19.
Screw-cutting, mechanism for, Oct., p.26.
Sound recording, control of, Aug., p.45.
Stokers, increasing efficiency of, March, p.36.
Testing, high speed, discussion of, Aug., p.40.
Thread knotting, developments in, Oct., p.52.
Tractors, advances in, May, p.24.
Typewriters, eliminating noise in, May, p.50.
Washing, multiplying uses of, Sept., p.19.
Welders, design of, Feb., p.24.
Welding, control of, Nov., p.20.

**Magnetism:**

Recording speech with, April, p.21.

**Manufacturers' Publications:**

Compilation of, Jan., p.62; Feb., p.62; March, p.60; April, p.62; May, p.69; June, p.84; July, p.70; Aug., p.61; Sept., p.62; Oct., p.69; Nov., p.70; Dec., p.70.

**Materials:**

*See also in Itemized Index.*
Alloys (Iron),
  employment of, Nov., p.36.
  gears, use of, for, July, p.22.
Alloys, (Steel),
  dairy machinery, use of, in, June, p.27.
  developments in, Oct., p.35.
  investigation of, Jan., p.32.
  subway cars, use of, for, Sept., p.41.
Alloy valve inserts, applying, April, p.39.
Alloys, discussion of, June, p.39.
Aluminum bronze,
  employing in welders, Feb., p.25.
  die castings of, Nov., p.24.
Aluminum,
  fans, use of, for, Oct., p.16.
  hard finish on, Dec., p.21.
  in transportation equipment, Oct., p.20.
  new process for production of, Nov., p.50.
  railroads, use of, on, May, p.48.
  reflectors, use of, for, Feb., p.19.
Babbitt, use of, for bearings, July, p.28; Nov., p.19.
Beryllium, limitations of, June, p.50.
Boron carbide, announcement of, Dec., p.60.
Brass,
  die castings of, Nov., p.24.
  choice of, for air conditioner, Oct. p.16.
  journal bearings, use of, for, Dec., p.19.
Bronze,
  alloys, announcement of, July, p.65.
  use of, for bearings, Oct., p.20; Dec., p.19.
Cast iron,
  dampening value of, May, p.42.
  employment of, March, p.26.
  increasing strength of, April, p.27.
  use of copper in, March, p.41.
Chemical stoneware, properties of, June, p.25.
Cobalt steel, uses of, Feb., p.18.
Copper-lead, for bearings, July, p.28.
Copper, use of, in cast iron, March, p.41.
Composition,
  advances in, April, p.22.
  applications of, Aug., p.21.
  cameras, use of, in, June, p.26.
  check valve diaphragm, use of, for, June, p.26.
  for insulating, announcement of, Sept., p.54.
  improving appearance with, Nov., p.19.
  with rubber surface, Sept., p.22.
Effect of temperature on properties of, Sept., p.41.
Glass, sealed to metal, Nov., p.21.
Magnesium, use of, on trains, Sept., p.46.
Metal-clad plates, description of, Dec., p.24.
Nickel alloys,
  discussion of, Dec., p.31.
  sealing glass to, Nov., p.21.
  studs, use of, for, Dec., p.35.

Nickel, consumption of, Jan., p.41.
Nonferrous, for gears, June, p.34.
Prefinished sheets, discussion of, Nov., p.27.
Quartz, use for windows, Sept., p.41.
Rare metals, applications of, Nov., p.50.
Rubber,
bonding to bakelite, Sept., p. 22.
insulation, use of, for, July, p.23.
reducing noise with, Oct., p.20.
springs, use of, as, Nov., p.29.
synthetic, use of, for tires, July, p.43.
vibration, use of, to combat, Feb., p.19; Dec., p.47.
Silica, use of, for springs, July, p.21.
Sound absorbing, May, p.26.
Stainless steel,
tubes of, Nov., p.21.
use of, in dairy industry, Nov., p.42.
Steel,
automobiles, use of, in, Dec., p.52.
case hardened, discussion of, Oct., p.36.
felt-bonded, announcement of, Sept., p.57.
for gears, June, p.33; July, p.33.
high-tensile low-alloy type, Oct., p.20; Dec., p.31.
opening markets for, Jan., p.41.
journal bearings, use of, for, Dec., p.19.
Steel sheets, properties of, Oct., p.35.
Tungsten carbide, applying, in machines, June, p.29.
Zinc, applications of, Jan., p. 33; May, p.19.

**Mechanisms:**

*See in Itemized Index.*

**Men and Their Machines:**

E. E. Adams and His High Speed Streamlined Train, March, p.37.
Robert R. Harkins and the Centrifugal Hot Oil Pump, Jan., p.37.
Henry T. Scott and His Paper Bottle-Filling Machine, Feb., p.35.

**Men of Machines:**

Biographical sketches, Jan., p.42; Feb., p.38; March, p.42; April, p. 40; May, p. 44; June, p.51; July, p.41; Aug., p.41; Sept., p.39; Oct., p.48; Nov., p.44; Dec., p.43.

**Motors:**

*See also under Parts in Itemized Index.*

Air conditioning, May, p.66.
Belt drives for, discussion of, July, p.32.
Building in, Sept., p.31; Nov., p.20.
Capacitor, announcement of, Jan., p.54; March, p.54; June, p.70.
Capacitor type, use of, in air conditioner, Oct., p.17.
Cooling, by use of gasoline, March, p.19.
Explosion proof, announcement of, April, p.54.
Fractional horsepower, announcement of, Jan., p.50; Feb., p.50.
Governor controlled, announcement of, Oct., p.64
Hollow shaft type, utilizing, Sept., p.19.
Locating, advantageously, Feb., p.18.
Mountings for, flange head type, announcement of, June, p.76.
Permanently lubricated, announcement of, July, p.67.
Protected coil type, announcement of, Nov., p.67.
Self-protected, announcement of, March, p.50.
Shaftless type, incorporating, in design, Oct., p.22.
Splash proof, announcement of, Feb., p.56, Oct., p.60.
Use of high torque, for clamping, Jan., p.17.
Variable speeds, obtaining with, Feb., p.30; Dec., p.20.
Ventilated type, announcement of, Aug., p.47.

**N**

**New Machines:**

Listing of, Aug., p.33; Sept., p.33; Oct., p.37; Nov., p.37; Dec., p.37.

**New Materials and Parts:**

Announcements of, Jan., p. 49; Feb., p.50; March, p.50; April, p.50; May, p.58; June, p.70; July, p.65; Aug., p.47; Sept., p.50; Oct., p.58; Nov., p.60; Dec., p.58.

**Noise:**

Combating, in transportation machines, April, p.33.
Eliminating, in typewriters, May, p.50.
Obviating, in valves, June, p.26.

**Nomographs:**

Employing, Jan., p.29.

**Noteworthy Patents:**

Jan., p.46; Feb., p.44; March, p.48; April, p.44; May, p.50; June, p.64; July, p.62; Aug., p.45; Sept., p.43; Oct., p.52; Nov., p.54; Dec., p.46.

**O**

**Obituaries:**

Barber, William, Nov., p.46.
Bassett, William H., Aug., p.60.
Berry, Dr. Edward R., Sept., p.40.
Bolgiano, William C., Oct., p.68.
Bray, Thomas J., Jan., p.44.
Drake, George W., Dec., p.44.
Eberhardt, Henry E., Aug., p.60.
Evinrude, Ole, Aug., p.60.
Faccioli, Giuseppe, Feb., p.40.
Ferner, R. Y., Dec., p.44.
Geier, Frederick A., May, p.46.
Gray, Prof. James G., Dec., p.44.
Hammar, Major William J., May, p.46.
Hartness, James, March, p.44.
Jacobs, Charles B., Dec., p.44.
Johnson, William T. F., Aug., p.60.
Kelly, John F., Dec., p.44.
Lynch, Tillman D., Jan., p.44.
Muller, Ernest J. W., Sept., p.40.
Potter, William Bancroft, May, p.46.
Rice, Calvin W., Nov., p.46.
Rowe, James P., Oct., p.68.
Von Miller, Oskar, June, p.52.
Watson, C. Roy, March, p.44.

**P**

**Packing Glands and Packing:**

*See also under Parts in Itemized Index.*

Bearing protection, building in, Aug., p.22.
Oil seals, utilizing, Jan., p.40.
Metallic type, design of, Oct., p.41.
Pump leakage, preventing, March, p.62.
Shaft mountings, sealing, Sept., p.44.
Shock rings, announcement of, April, p.58.
Stuffing boxes, eliminating, June, p.27.
Unit oil seals, announcement of, Nov., p.60.

**Patents:**

*See also Noteworthy Patents.*

Assignments of, perfecting, Sept., p.15.
Appearance, protecting value of, Nov., p.15.
British records on, Dec., p.54.

Contracts regarding, perfecting, April, p.29.
International protection of, Aug., p.40.
Inventions, possibilities in, Feb., p.27.
Licenses of, securing, Sept., p.15.
Procedure on, determining, Jan., p.39; July, p.24.
Protection of, May, p.42.

**Personal Items:**

Compilation of, Jan., p.43; Feb., p.39; March, p.43; April, p.41; May, p.45; June, p.52; July, p.42; Aug., p.42; Sept., p.40; Oct., p.50; Nov., p.46; Dec., p.44.

**Photoelectric Units:**

*See Electronic Devices.*

**Potentiometers:**

Balanced, announcement of, June, p.72.

**Principles:**

*See Itemized Index.*

**Production Department:**

Composition materials, advantages of, to, June, p.26.
Costs of, reducing, Oct., p.20.
Drills, grinding, Sept., p.31.
External broaching, possibilities of, Feb., p.28.
High clamping pressure, securing, July, p.21.
Internal centerless grinding, March, p.20.
Metal-clad sheet, fabrication procedure, Dec., p.23.
Shrink fits, simplifying, Aug., p.20.
Sizing, maintaining, April, p.20.
Springs, winding of helical silica, July, p.21.
Surface broaching, advances in, Nov., p.48.
Tubes, grinding internally, May, p.25.
Valve inserts, inserting, April, p.39.

**Professional Viewpoints:**

Jan., p.39 Feb., p.37; March, p.39; April, p.37; May, p.41; June, p.49; Aug., p.37; Sept., p.37; Oct., p.41; Nov., p.41; Dec., p.41.

**Pumps:**

*See also under Parts in Itemized Index.*

Acid, developing, June, p.23.
Centrifugal units, announcement of, Dec., p.64.
Computing, designing, May, p.19.
Constant pressure, obtaining, Nov., p.19.
Cooling of, March, p.19.
Feeding, for oil burners, announcement of, Aug., pp.52, 56, 58.
Gasoline, use of springs in, June, p.31.
Hydraulic, announcement of, Feb., p.50; Nov., p.66.
Leakage in, preventing, March, p.62.
Rotary, high pressure, announcement of, Jan., p.60.
Uniform discharge, maintaining, Feb., p.46.
Venturi tubes, use of, as, Nov., p.19.
Walking beam type, retirement of, Nov., p.35.

**Pyrometers:**

Adaptable, announcement of, April, p.50.

**R**

**Railroads:**

Activity in, Oct., p. 46; Dec., p.56.
Aluminum, use of, in, May, p.48.
Cars, roof design of, Nov., p.20.
Locomotive fireboxes, eliminating, June, p.28.
Magnesium metal, use of, Sept., p.46.
Materials for, Dec., p.31.
Steel balls, use of, for wheels, March, p.40.
Street cars, materials employed in, Oct., p.20.
Subway cars, redesign of, Sept., p.41.

**Recorders:**

Friction, utilizing in, Aug., p.21.

**Regulators:**

Adjustable, announcement of, April, p.58.

**Research Publications:**

Compilation of, March, p.61; May, p.71; June, p.86, July, p.71; Aug., p.62; Oct., p.71; Nov., p.71; Dec., p.71.

**S**

**Sales and Design:**

Appeal enhancing, Nov., p.19.
Appearance value, protecting, Nov., p.15.
New designs, answering requirements for, Sept., p.31.

**Scanning the Field for Ideas:**

Jan., p. 17; Feb., p.17; March, p.19; April, p.19; May, p.24; June, p.26; July, p.21; Aug., p.19; Sept., p.19; Oct., p.19; Nov., p.19; Dec., p.20.

**Shafting:**

Connecting, by springs, July, p.64.
Deflection of, combating, Feb., p.15.
Endwise movement, attaining, Aug., p.19.
Fatigue of, overcoming, Dec., p.25.
High speeds, accommodating, Feb., p.20.
Increased loads, supporting, Feb., p.20.
Mountings, improvements in, Sept., p.45.
Strength of, determining, Oct., p.29.
Stresses in, reducing, March, p.26.
Wear of, combating, July, p.30.

**Shapes:**

Cold drawn, for spindles, Oct., p.20.

**Society of Automotive Engineers:**

Anniversary activity of, Nov., p.50.
Annual meeting, discussion of, July, p.28.
Discussions in meeting of, Nov., p.48.

**Solenoids:**

*See under Mechanisms in Itemized Index.*

**Speed Reducers:**

*See also Drives; see also Drives under Parts in Itemized Index.*

Adjusting with, Feb., p.19.
Limited space, applying, in, May, p.26.
Motorized type, announcement of, Jan., pp.50, 58; Feb., p.59; March, p.59; June, p.72; July, p.66; Nov., p.62; Dec., p.58.
Motorized type, multispeed, announcement of, Jan., p.56; Nov., p.65.
Motorized, variable speed type, announcement of, Oct., p.62.
Ratings of helical and herringbone, June, p.40; July, p.33.
Rolling wedge type, Feb., p.18.
Worm and gear type, use of, for driving observatory, Aug., p.15.

**Springs:**

*See also under Parts in Itemized Index.*

Actuating mechanisms by, April, p.16.
Air conditioner, use of, in, Oct., p.18.
Automobile, developments in, Jan., p.13.
Compensating, Dec., p.36.
Errors in, eliminating, June, p.49.

Helical, application of, June, p.31.
Helical silica, winding of, July, p.21.
Inertia, combating with, Nov., p.41.
Leaf type, use of, in automobiles, June, p.27.
Relieving tappet springs by, May, p.25.
Specifications for, determining, May, p.34.
Torque transmission, use of, in, July, p. 64.

**Standardization:**

*See also Itemized Index.*

Activities in, April, p.39.
Drawing and drafting room practice, classifying, Aug., p.27.
Electric welding, advances in, March, p.40.
Importance of, Sept., p.41.
Lubricant classification, March, p.41.
Parts numbers, system of, March, p.15.
Pressure and vacuum gages, Dec., p.52.
Tapered roller bearings, recommendations for, Sept., p.42; Oct., p.44.

**Steel Balls:**

Pumps, use of, in, Feb., p.46.
Wheels, replacing with, March, p.40.

**Steel Cable:**

Use of, for driving, Aug., p.15.

**Stresses:**

Fatigue failures, reducing, Nov., p.68; Dec., p.25.
Gear, discussion of, June, p.40; July, p.33.
In cylindrical bodies, April, p.37.
Moments of inertia, determining, May, p.23.
Resistance to, increasing, in cast iron, April, p.27.
Shafting, determination of, Feb., p.20.

**Style in Design:**

Achieving, in automobiles, Jan., p.13.
Appearance, improving, Feb., p.17.
Cameras, considering for, June, p.26.
Colors, employment of, Oct., p.21.
Designing for, Sept., p.19.
Increasing appeal of, Nov., p.19.
Industrial trucks, improving, Nov., p.28.
Mixing machines, improving, Feb., p.18.
Streamlining, application to boats, May, p.25.
Value of, protecting, Nov., p.15.

**T**

**Testing:**

Cameras, use of, Sept., p.46; Dec., p.20.
Finishes, determining roughness of, May, p.31.
Oscillograph, use of, for, Sept., p.29.
Photoelasticity, checking design by, Oct., p.25.
Press-fitted units, determining effect of, Dec., p.25.

**Topics:**

Digest of, Jan., p.41; Feb., p.42; March, p.40; April, p.39; May, p.48; June, p.50; July, p.43; Aug., p.39; Sept., p.41; Oct., p.44; Nov., p.48; Dec., p.52.

**Transmissions:**

*See also Drives; also Drives under Parts in Itemized Index.*

Hydraulic, for automobiles, April, p.19.
Truck refrigerator, announcement of, Oct., p.58.

**Tubes:**

External cooling system, use of, in, Nov., p.21.
Friction in, reducing, June, p.28.

**U**

**Universal Joints:**

Conveyors, use of, in, Dec., p.35.

**V**

**Vacuum:**

Glass handling, use of, in, May, p.54.
Holding photographic film, use of, for, Dec. p.46.

**Valves:**

Balanced, announcement of, June, p.70.
Check, design of, June, p.26.
Diaphragms for, balancing, June, p.26.
Diesel engine, perfecting, March, p.33.
Fouling, eliminating, of, Feb., p.37.
Efficiency, improving, Jan., Edit. 26.
Foot operated control, announcement of, Aug., p.48.
Industrial relief, announcement of, Oct., p.60.
Operation of, by magnets, July, p.23.
Sealing of, Jan., p.40.
Wire drawing, eliminating, Sept., p.20.

**V-Belts:**

*See also Drives under Parts in Itemized Index.*

Balanced type, announcement of, July, p.68.

**Vibration:**

Combating, in machinery, Dec., p.47.
Creating, May., p.52.
Dissipating, Feb., p.19.
Eliminating, in oil burners, July, p.23.

**W**

**Welded Parts and Equipment:**

*See under Parts in Itemized Index.*

Alternating current equipment, announcement of, Oct., p.67.
Current control, announcement of, May, p.67.
Cylinders, use of, for, July, p.43.
Designing for, Nov., p.20.
Electric, standards for, March, p.40.
Electrodes, announcement of, Jan., p.54; May, pp.60, 62; July, p.66; Oct., p.62.
Fans, fabricated by, Oct., p.16.
Feeding head, announcement of, Aug., p.56.
Flame cut surfaces, advantages of, for, Dec., p.52.
Hard facing rods, applying, May, p.27.
Interest in, Feb., p.42.
Metal-clad sheets, fabrication of, Dec., p.24.
Progressive steps in, Nov., p.20.
Stainless steel, fabrication of, Oct., p.36.
Steam cylinder, design of, July, p.19.
Stress relief, discussion of, Oct., p.36.
Timers, announcement of, Oct., p.64; Dec., pp.60, 62, 64.

**Wire:**

Electrical cellophane covered, announcement of, Oct., p.62.
Wire feed, drive for, Nov., p.20.

# ITEMIZED INDEX

## January to December, 1934

*Key: Edit, Editorial Pages; Adv, Advertising Pages; R, Right hand column; L, Left hand column*


**Design Calculations:**

Acceleration forces, determining, Nov., Edit. 31, 32, 33, 34, 35
Circular arcs, Jan., Edit. 39R, 40
Compression chambers, Aug., Edit. 25, 26L
Cylindrical bodies, April, Edit. 37, 38
Differential screws, April, Edit. 25, 26, 27
Drop in curves, June, Edit. 49
Dynamic system of parts, Jan., Edit. 29, 30, 31, 32
Gears, helical and herringbone, June, Edit. 40-45, 53-60; July, Edit. 33-37, 44-61
Indexing mechanism, Oct., Edit. 26, 27, 28, 67L
Moment of inertia, May, Edit. 23
Shaft deflection, Feb., Edit. 20, 21, 22
Shrink and press fits, Dec., Edit. 41L, 42
Springs, May, Edit. 34, 35
Torsion in shafting, Oct., Edit. 29
Velocity and force relationships, Sept., Edit. 24, 25, 26, 27

**Design Problems:**

Accelerations, determining, Nov., Edit. 31, 32, 33, 34, 35
Appearance, improving, May, Edit. 19, 22; Sept., Edit. 19; Nov., Edit. 19, 28, 29, 30, 37
Automaticity, advancing, July, Edit. 17, 18, 19, 20
Bearings,
Bearing metals, specifying, Edit. 28, 29L
journal, applying, Dec., Edit. 15, 16, 17, 18, 19
sealed and shielded, utilizing, Aug., Edit. 22, 23 24
Calculations simplifying, Jan., Edit. 29, 30, 31, 32; Feb., Edit. 20, 21, 22
Centrifugal forces, harnessing, Feb., Edit. 13, 14, 15 16
Ceramic material, utilizing, June, Edit. 23, 24, 25 80R, 82R
Chains, utilizing on drives, June, Edit. 36, 37, 38
Chromium plating, applying, July, Edit. 30, 31, 32
Circulation, securing proper, June, Edit, 27R, 28L
Color, employing on machine, March, Edit. 22, 23, 24, 25
Combustion securing complete, March, Edit. 26, 27, 28, 29L
Compactness, obtaining, Oct., Edit. 15, 16, 17, 18
Consumer's desires, satisfying, Aug., Edit. 29; Sept., Edit. 19, 31, 32
Continuous service, satisfying, Jan., Edit. 25, 26, 27
Conveying, around corners, Dec., Edit. 35, 36
Cooling, obtaining efficient, March, Edit. 19, 20L
Corrosion, resisting, June, Edit. 23, 24, 25, 80R, 82R; July Edit. 30, 31, 32; Dec., Edit. 22, 23 24
Costs, reducing, May, Edit. 22
Crank stroke, doubling, Feb., Edit. 37R, 61
Cushioning, perfecting, Jan., Edit. 47
Designs for appearance, protecting, Nov., Edit. 15, 16, 17, 18, 69L
Die castings, utilizing, Jan., Edit. 33, 34, 35; Nov., Edit. 24, 25, 26
Dies, controlling, Feb., Edit. 44, 46L
Diesel engine,
developing small, Aug., Edit. 25, 26L
starting, Sept., Edit. 21R, 22L
Domestic appliances, mechanizing, May, Edit. 36, 37
Drawings, reducing number of, Nov., Edit, 22, 23
Drives, providing economical, Sept., Edit. 22
Driving, hydraulically, April, Edit. 19, 20L; Sept., Edit. 37, 38L; Oct., Edit. 41
Dry materials, handling, July, Edit. 22R, 23L
Ease of operations, insuring, March, Edit. 31
Electrical devices and mechanisms, combining, Feb., Edit. 24, 25, 26, 27
Engines, supercharging, Jan., Edit. 15R, 16
External broaching, considering, Feb., Edit. 28, 29
Fatigue, overcoming, Dec., Edit. 25, 26, 27, 67L, 68R
Frames, reinforcing, Jan., Edit. 15R
Friction, utilizing, Aug., Edit. 21
Gearing, specifying helical and herringbone, June, Edit. 40-45, 53-62, 89R; July, Edit. 33-37, 44-61
Gears,
determining pitting of, Aug., Edit. 37, 38L
insuring proper contact of, April, Edit. 20
Hand operations, replacing, March, Edit. 48, 62L
Hard-Facing, utilizing, May, Edit. 27, 28, 29, 30L
Hydraulic drives, applying, Jan., Edit. 20, 21, 22 23; April, Edit. 19, 20L; Dec., Edit. 28, 29, 30
Inertia, overcoming, Nov., Edit. 41R, 42L
Large structures, motivating, Aug., Edit. 15, 16, 17, 18
Liquids, discharging, Feb., Edit. 14R, 15 16
Lubrication insuring adequate, Oct., Edit. 31, 32
Machine operators, considering, March, Edit. 30, 31, 32, 45; April, Edit. 39R
Materials,
conveying, Aug., Edit. 30, 31, 32
selecting, April, Edit. 15, 16, 17, 18, 22, 23, 24; Oct., Edit. 35, 36
separating, Dec., Edit. 21R
Mechanisms, combining, Sept., Edit. 19, 21
Moment of inertia, determining, May, Edit. 23
Motors and controls, utilizing, Feb., Edit. 30, 31, 32, 33
Motors, building into machines, Oct., Edit. 22, 23 24 25
Nameplates, specifying, Oct., Edit. 34, 35
Noise, combating, April, Edit. 33; May, Edit. 25R, 26, 50R, 52R; Oct., Edit. 15, 16, 17, 18
Numbering systems, devising, March, Edit. 15, 16, 17, 18
Oil engines, improving, March, Edit. 33, 34, 35, 45R
Operating conditions, considering, May, Edit. 41R, 42L; Oct. Edit, 19, 30; Nov., Edit. 28, 29, 30
Packing, simplifying, Jan., Edit. 40R
Paint spray, eliminating, Aug., Edit. 20R, 21L
Parts, reducing nnmber of, Aug., Edit. 22, 23, 24
Patent contracts, perfecting, April, Edit. 29, 30, 31, 32, 61L
Patents,
perfecting agreements on, Sept., Edit. 15, 16, 17, 18, 60R, 61L
securing safe, July, Edit. 24, 25, 26, 27, 42R
Performance,
determining, Dec., Edit. 20
perfecting, March, Edit. 26, 27, 28, 29L
Phenolic plastics, applying, April, Edit. 22, 23, 24

Prefinished sheets, employing, Nov., Edit. 27
Press fits, developing, Dec., Edit. 25, 26, 27, 67L, 68R
Pressure, balancing, June, Edit. 26R, 27L
Prices, computing mechanically, May, Edit. 21.
Production costs, reducing, Oct., Edit. 20R
Propellers, changing pitch of, Sept., Edit. 23
Range of movement, widening observers', Aug., Edit. 15, 16, 17, 18
Ratings, determining gear, June, Edit. 40-45, 53-62, 89R
Reciprocating motion, securing long, March, Edit. 39
Register wheels, locking, Jan., Edit. 17
Rotation, obtaining high speed, Sept., Edit. 19R, 20L
Safety, insuring, March, Edit. 31R, 32, 45L; July, Edit. 17, 18, 19, 20; Oct., Edit. 30; Nov., Edit. 28, 29; Dec., Edit. 48R
Screws, determining efficiency of differential, April, Edit. 25, 26, 27
Separating, centrifugally, May, Edit. 24R, 25L
Shafts,
computing deflection of, Feb., Edit. 20, 21, 22
determining torsion in, Oct., Edit. 29
lubricating vertical, Feb., Edit. 14, 16
reducing torsion in, March, Edit. 27R, 28R
Shrink and press fits, calculating, Dec., Edit. 41L, 42
Sizing, controlling automatically, April, Edit. 20R, 21L
Skimming, accomplishing automatically, Sept., Edit. 38
Speeds,
controlling, Feb., Edit. 19L; Aug., Edit. 45
increasing automatically, Sept., Edit. 43
varying, Jan., Edit. 20, 21, 22, 23; Feb., Edit. 30, 31, 32, 33
Springs,
applying, Jan., Edit. 13, 14, 15L, 16L
employing helical, June, Edit. 31, 32
insuring adequate, May, Edit. 34, 35
Standard parts, utilizing, Oct., Edit. 15, 16, 17, 18
Steam, using in airplanes, Jan., Edit., 19R, 61
Steam boilers, eliminating, June, Edit. 28
Steels,
choosing for gears, June, Edit. 33, 34L; July, Edit. 33, 34, 35, 36
high tensile, applying, Dec., Edit. 31, 32, 33, 34, 69L
Streamlining, Jan., Edit. 15
Strength of metals, increasing, April, Edit. 27R
Stresses, determining, April, Edit. 37, 38
Tension in tapes, etc., maintaining, April, Edit. 44
Testing, without destroying, Sept., Edit. 29, 30; Oct., Edit. 25R
Tooth contact, insuring proper, April, Edit. 20
Torsion, reducing, March, Edit. 27R, 28R
Valves, preventing fouling of, Feb., Edit. 37
Variable speeds, securing, Jan., Edit. 20, 21, 22, 23; Feb., Edit. 27L, 30, 31, 32
Velocity and force, determining, Sept., Edit. 24, 25, 26, 27, 28
Vertical shafts, lubricating, Feb., Edit. 14, 16
Vibration, combating, Feb., Edit. 19; April, Edit. 33; July, Edit. 23
Wear, combating, May, Edit. 27, 28, 29, 30L; June, Edit. 29, 30; July, Edit. 30, 31, 32
Weight, reducing, April, Edit. 15, 16; May, Edit. 20R, 22; Nov., Edit. 20

**Finishes:**

Aluminum, Feb., Edit. 19R; March, Edit. 50; Nov., Edit. 42R
Aluminum paint, Dec., Edit. 62R
Bright colors, employing, March, Edit. 22, 23, 24, 25
Color, use of, Oct., Edit. 21
Decorative, on phenolic plastics, April, Edit. 22, 23, 24
Electrodeposited, Jan., Edit. 15; April, Edit. 18; May, Edit. 20L; June, Edit. 74R; July, Edit, 30, 31, 32; Sept., Edit. 31R; Dec., Edit. 21R
Prefinished sheets, Nov., Edit. 27
Roughness, measuring, May, Edit. 31
Tin plating, Sept., Edit. 20
Vacuum plating, April, Edit. 24R

**Materials:**

Alloys (Hard-Facing), Jan., Adv. 9; Feb., Adv. 66; March, Edit. 21L; April, Edit. 39, 60R; Adv. 59R; May, Edit. 27, 28, 29, 30L; June, Edit. 29, 30; Adv. 78L; Aug., Adv. 54L; Oct., Adv. 69R; Dec., Edit. 60; Adv. 69R
Alloys (Iron), Jan., Edit. 49; March, Edit. 41R; July, Edit. 22; Nov., Edit. 21, 36, 68R
Alloys (Nickel), Jan., Edit. 41L; Adv. 53; Feb., Adv. 49; April, Edit. 20R; Adv. 2; May, Edit. 20R; Adv. 12; June, Edit. 34, 49R; Adv. 79; Sept., Edit. 19; Oct., Edit. 35L; Adv. 43; Nov., Edit. 20L, 21R; Adv. 57; Dec., Edit. 22, 23, 24, 29L, 31, 32, 33, 34, 35R, 69L
Alloys (Steel), Jan., Edit. 14L, 15R, 26R, 32R; Adv. 57; Feb., Edit. 18L; Adv. 12; March, Edit. 20L, 35R; Adv. 13; June, Edit. 28L, 33, 34L, 39, 50, 82R; Adv. 75; Sept., Edit. 19L, 41L; Oct., 21L, 36; Adv. 57; Nov., Edit. 21R, 29R, 42R; Adv. 63; Dec., Edit. 19R, 22, 23, 24, 31, 32, 33, 34, 35R, 69L
Aluminum Jan., Edit. 15; Feb., Edit. 19R, 25R; March, Edit. 31R; May, Edit. 48; July, Edit. 23R; Oct., Edit. 16R, 20R, 21L; Nov., Edit. 20L, 24, 25, 26, 50L; Dec., Edit. 21R
Babbitt, July, Edit. 28, 29L; Dec., Edit. 19
Beryllium, June, Edit. 50
Bimetal, Jan., Edit. 16L
Brass, Feb., Edit. 26; Oct., Edit. 16R; Nov., Edit. 24, 25, 26; Dec., Edit. 19, 28R
Bronze, Jan., Edit. 15R, 60R; June, Edit. 34; July, Edit. 65L, 66R; Aug., Edit. 48R, 50L; Nov., Edit. 24, 25, 26; Dec., Edit. 16R, 17R, 18, 19, 28R
Ceramic, June, Edit. 23, 24, 25, 80R, 82R
Composition, Feb., Edit. 24L, 26L; April, Edit. 22, 23, 24; May, Edit. 20L; June, Edit. 26, 35R; Aug., Edit. 21R; Sept., Edit. 22L, 54R, 55L; Nov., Edit. 19L
Copper, April, Edit. 24R; Oct., Edit. 18R; Dec., Edit. 19, 28R
Cork, Feb., Edit. 16L
Glass, July, Edit. 29R; Nov., Edit. 21
Iron, March, Edit. 27L, 28R, 29L
Magnesium, March. Edit. 31R; April, Edit. 15, 16L; May, Adv. 9; Sept., Edit. 46R
Malleable iron, Jan., Edit. 25R
Metal (Felt-Bonded), Sept., Edit. 57R, 58L
Molybdenum, June, Adv., 8; July, Adv. 11; Aug., Adv. 9; Oct., Adv. 9; Dec., Edit. 33R, 34R; Adv. 9
Rare metals, Nov., Edit. 50R
Rubber, Jan., Edit. 15R, 16L, 47; Feb., Edit. 19; March, Edit. 62; April, Edit. 33R; July, Edit. 22L, 23, 43L; Oct., Edit. 17, 21L; Nov., Edit. 29R; Dec., Edit. 29R, 47, 48L
Silica, July, Edit. 21R, 22L
Steel, June, Edit. 33, 34L; Aug., Adv. 2; Sept., Edit. 41R; Dec., Edit. 16R, 18L, 19, 52R; Adv. 14, 59
Steel (Metal-Clad), Dec., Edit. 22, 23, 24
Zinc, Jan., Edit. 33, 34, 35; Adv. 67; March, Adv. 67; May, Edit. 20R, 21R, 26R; Adv. 75; July, Edit. 31R; Adv. 75; Sept., Adv. 67; Nov., Adv. 75

**Mechanisms:**

Adjusting, Feb., Edit. 27; March, Edit. 29L; April, Edit. 44R, 46R
Agitating, Sept., Edit. 44R, 46L
Air conditioning, April, Edit. 21; Oct., Edit. 15, 16, 17, 18
Bellcrank, March, Edit. 20R, 21L
Braking, Jan., Edit. 19; March, Edit. 45L; Aug., Edit. 45R, 46; Dec., Edit. 56L
Cam, Jan., Edit. 46R; Feb., Edit. 26R, 44, 46L; April, Edit. 16R, 17L, 18R; Nov., Edit. 34, 35, 56R, 58R
Casting, July, Edit. 62R
Clamping, July, Edit. 21
Clutch, Feb., Edit. 17R, 18L; May, Edit. 26L; Sept., Edit. 37, 38L; Dec., Edit. 56L

Coin, May, Edit. 56R
Compensating, Feb., Edit. 46
Computing, May, Edit. 21
Conveying, Aug., Edit. 30, 31, 32
Counterweighting, July, Edit. 19; Aug., Edit. 17, 18; Sept., Edit. 23
Cushioning, Jan., Edit. 47
Cutting, June, Edit. 64
Driving, Feb., Edit. 16, 18; March, Edit. 26, 27R, 28; April, Edit. 19, 20; July, Edit. 63L, 64R; Aug., Edit. 16, 17, 18, 45; Sept., Edit. 22, 43, 44
Equalizing, Oct., Edit. 21R
Feeding, June, Edit. 66; Oct., Edit. 54; Dec., Edit. 46R, 47L
Geneva, April, Edit. 17L
Grinding, March, Edit. 20; Aug., Edit. 46R, 63L
Indicating, Oct., Edit. 26, 27, 28, 67L
Juice extracting, June, Edit. 64
Level controlling, Nov., Edit. 54
Leverage, April, Edit. 44R, 46R
Lifting, Nov., Edit. 30L
Magnetic, July, Edit. 23L
Materials handling, July, Edit. 22R, 23L
Photographic, Dec., Edit. 46
Pneumatic, Jan., Edit. 47R; Feb., Edit. 26L; April, Edit. 20R, 21L; May Edit. 25L; July, Edit. 22R, 23L
Printing, Nov., Edit. 54R, 56R
Pulling, Sept., Edit. 21
Quick return, Nov., Edit. 34, 35
Reciprocating, Nov., Edit. 41
Refrigerating, March, Edit. 20; Oct., Edit. 19R, 20L; Dec., Edit. 20R, 21L
Reversing, June, Edit. 64R, 66L
Safety, March, Edit. 31R, 32L, 45L; July, Edit. 19
Scotch yoke, Dec., Edit. 41
Screw cutting, Oct., Edit. 26, 27, 28, 67L
Sealing, Feb., Edit. 46R
Shock absorbing, Jan., Edit. 15L, 16R
Skimming, Sept., Edit. 38
Snubbing, Jan., Edit. 14L
Solenoid, Jan., Edit. 17; April, Edit. 20R
Speed reducing, May, Edit. 26
Spring, Jan., Edit. 13, 14, 15L, 16L
Starting, Sept., Edit. 21R, 22L
Stirring, June, Edit. 27L, 28R
Stranding, Oct., Edit. 52
Take-up, April, Edit. 44
Timing, Sept., Edit. 42R
Toggle, Feb., Edit. 26L
Transferring, May, Edit. 54R, 56R; June, Edit. 66
Tripping, Oct., Edit. 19
Typewriting, May, Edit. 50R, 52R
Valve regulating, Dec., Edit. 28R, 30L
Vibration dampening, Dec., Edit. 47R, 48L
Vibrating, May, Edit. 52R, 54R
Walking beam, Nov., Edit. 34, 35

**Organization and Equipment:**

Calculations, simplifying, Jan., Edit. 29, 30, 31, 32; Feb., Edit. 20, 21, 22; April, Edit. 37, 38
Circular arcs, employing, Jan., Edit. 39R, 40
Engineering department, Jan., Adv., 62L; Feb., Edit. 52; Adv. 56, 60L; March, Edit. 50L; Adv. 58L; April, Adv. 54L, 56L; May, Adv. 3, 66L; June, Edit. 76R, 78R; Adv. 73, 76L, 80L; July, Edit. 68R, 69L; Adv. 71R; Aug., Edit. 27, 28, 38, 59L; Adv. 60L, 63R; Sept., Edit. 58R, 59L; Adv. 64L; Oct., Edit. 33, 41R, 65L, 66R; Adv. 67R, 70L; Nov., Edit. 22, 23; Adv. 56L; Dec., Adv. 67R, 68L
Engineering, relation to other departments, May, Edit. 30
Inspection, May, Adv. 10
Markets, developing, Dec., Edit. 66R, 67L
Nomographs, employing, Jan., Edit. 29, 30, 31, 32
Patent law and patent activity, Jan., Edit. 39; Feb., Edit. 23L; April, Edit. 29, 30, 31, 32, 61L; July, Edit, 24, 25, 26, 27, 42R; Aug. Edit. 40L; Sept. Edit. 15 16 17, 18, 60R, 61L; Nov., Edit. 15, 16, 17, 18, 41L, 69L; Dec., Edit. 54L
Piece rate systems, May, Edit. 32, 33, 68R
Research and invention, Jan., Edit. 28L, 32R; Feb., Edit. 27R; April, Edit. 39; Dec., Edit. 54

**Parts:**

Bearings,
ball, Jan., Edit. 49L, Adv. 6; 51, 52L; Feb., Edit. 14, 15, 16L; Adv. 6, 41, 47, 52L; March, Edit. 63L; Adv. 6, 9, 14, 53R; April, Adv. 6, 12, 13, 46L, 55; May, Adv. 6, 45, 74; June, Adv. 6, 16, 17, 72L, 85; July, Adv. 6, 47, 58L; Aug. Edit. 22, 23, 24, 47; Adv. 6, 11, 49, 52L; Sept., Edit. 23R, 54R; Adv. 6, 14, 45, 52L; Oct., 23L, 24R; Adv. 6, 63; Nov., Edit. 29R, 30L; Adv. 2, 6; Dec., Adv. 6, 64L, 74
journal, Dec., Edit. 15, 16, 17, 18, 19
needle, April, Edit. 50R; Sept., Edit. 52R, 54R; Nov., Edit. 28R; Dec., Edit. 17L, 60R
pillow blocks, Nov., Edit. 60R
plain, Jan., Edit. 15R; Feb., Edit. 15; March, Edit. 27R, 28R; May, 20L, 21R, 64R, 66R; July, Edit. 31R; Oct., Edit. 20, 31R, 32; Nov., Edit. 28R; Dec., Edit. 16, 18, 19
roller, Jan., Edit. 26L, 27L; Adv. 6; Feb., Adv. 52L, 68; March, Adv. 49, 53R, 66; April, Adv. 68; May Adv. 49, 50L, 55; June, Adv. 72L, 92; July, Edit. 68R; Adv. 3, 74; Aug., Edit. 17, 18, 19; Adv. 52L, 68; Sept., Edit. 42R, 46R; Adv. 51, 52L, 66; Oct., Edit. 44; Adv. 65R, 76; Nov., Edit. 28R, 48R; Adv. 49, 59; Dec., Adv. 76.
thrust, Feb., Adv. 52L, 58L; March, Edit. 21; Adv. 53R, 58L; April, Adv. 58L; May, Adv. 66L; June, Adv. 82L; July, Adv. 66L; Nov., Edit. 48R; Dec., Edit. 15
Brakes, Sept., Edit. 50R, 52R; Dec., Edit. 58R, 60L
Cast parts,
design, March, Edit. 27L, 28R, 29L
die castings, Jan., Edit. 33, 34, 35; May, Edit. 20R, 21R, 26R; Sept., Edit. 31R; Nov., Edit. 24, 25, 26; Dec., Edit. 45
iron, Jan., Edit. 49; Feb., Edit. 23R; March, 27L, 28R, 29L, 41R; April, Edit. 27R; May, Edit. 42R; June, Edit. 25, 82R; Nov., Edit. 36, 68R
nonferrous, Jan., Edit. 60R; March, Edit. 31R; July, Edit. 23R; Oct., Edit. 21L; Dec., Edit. 19L
steel, Feb., Edit. 25R; Oct., Edit. 36L; Dec., Edit. 28R
Clutches,
hydraulic, April, Edit. 19, 20L; Sept., Edit. 37, 38L; Oct., Edit. 41
magnetic, Jan., Edit. 18; March, Edit. 57L; Adv. 68; May, Edit. 62R; Adv. 69, 76; June, Adv. 87; July, Adv. 64L, 70L; Aug., Adv. 62L; Sept., Adv. 61R, 68; Nov., Adv. 68L, 71R; Dec., Adv. 62L
mechanical, Jan., Edit. 16, 46, 58R, 59L; Feb., Edit 17R, 18L; March, 53L, 64R; May, Edit. 26L; July, Edit. 19L, 66R, 67L; Adv. 67R; Sept., Edit. 56R, 57L; Nov., Adv. 67R
over-running, Jan., Adv. 60; May, Edit. 58R
Compensators, Sept., Edit. 46L
Compressors, Dec., Edit. 62R
Controllers, Jan., Edit. 52R, 54R; Feb., Edit. 31L, 33; April, Edit. 17, 59L; June, Edit. 72R, 74R, 76R, 78R
Controls (Electrical),
capacitors, Jan., Edit. 59L, 60L
circuit breakers, May, Edit. 60R, 62R
drum controllers, Feb., Edit. 33R
general, Jan., Edit. 19; Adv. 68; Feb., Adv. 51; June, Adv. 10; July, Adv. 76; Aug., Adv. 66; Sept., Adv. 2; Oct., Adv. 51; Nov., Adv. 76; Dec. Adv. 61
governors, Feb., Edit. 31R
motor operators, Feb., Edit. 58R; May, Adv. 2
push buttons, March, Edit. 31L; April, Edit. 54R, 56R; Aug., Edit. 18R
relays, Feb., Edit. 60R; Aug., Edit. 18R; Oct. Edit. 16L
rheostats, Feb., Edit. 33
solenoids, Jan., Edit. 17; Oct., Edit. 54

starters, Jan., Adv. 2; Feb., Edit. 33L; March, Edit. 52R, 58R, 59L; Adv. 2; April, Adv. 3, 45; July, Adv. 2; Aug., Edit. 52R; Sept., Edit. 50; Oct., Adv. 2; Dec., Adv. 2

switches, Feb., Edit. 32L, 54R, 56R; March, Edit. 58R; April, Edit. 20R, 21L, 46R 48R, 56R; May, Edit. 11; July, Edit. 19; Aug., Edit. 47L; Sept., Edit. 55L, 56R, 59L; Oct., Edit. 16L, 54, 60R. 62; Nov., Edit. 28R

timing, Feb., Edit. 58R, 59L; April, Edit. 59L, 60R; Oct., Edit. 64R

Converters, June, Edit. 74R, 76R, 78R

Conveyors, April, Edit. 17R, 18L; July, Adv. 63R; Aug., Edit. 30, 31, 32; Sept. Edit. 55L; Adv. 59R; Nov., Adv. 62L

Couplings, Jan., Edit. 49R, 50; Adv. 61, March, Edit. 54R, 55R; April, Edit. 52R, 54R; June, Adv. 18, 19; July, Edit. 65L; Nov., Edit. 66L; Dec., Edit. 30R

Drives,

chain, Jan., Adv. 59R; Feb., Adv. 8, 9, 57; March, Adv. 11, 54L; April, Adv. 10, 11, 49, 50L; May, Adv. 68L; June, Edit. 36, 37, 38 74R; Adv. 14, 15, 69, 84L, 90; July, Edit. 18R, 19; Adv. 51, 66L; Aug., Adv. 3, 53, 57; Sept., Edit. 50L; Adv. 49, 56L; Oct., Edit. 42; Adv. 3, 14, 47, 68L; Nov., Edit. 41; Adv. 3, 47; Dec., Edit. 35R, 36L; Adv. 3, 53, 57

flat belts, April, Edit. 56R, 58R; July, Edit. 32R

friction, Feb., Edit. 14, 15, 18; Dec. Edit. 47

gearsets, Feb., Edit. 54R; March, Edit. 27R, 28; Adv. 65R; April, Edit. 19, 20; May, Edit. 21, 22, 26; Adv. 59; June, Edit. 40-45, 53-62, 89R; Adv. 12, 13, 18, 19, 21, 65, 83, 91; July, Edit. 18R, 19, 33-37, 44-61, 63L, 64R; Adv. 8, 9; Aug., Edit. 16, 17, 18, 37, 38; Sept., Edit. 22, 27R, 43R, 44; Oct., Edit. 26, 27, 28, 61L; Nov., Edit. 20R, 21L, 30L; Adv. 70L; Dec., Adv. 51

heliocentric, Feb., Edit. 19L

hydraulic, Jan., Edit. 20, 21, 22, 23; Feb., Edit. 52R; April, Edit. 19, 20; Oct., Edit. 41, 58R, 60L

motorized reducers, Jan., Edit. 50L, 56R, 58R; Adv. 63R; Feb., Edit. 30, 31, 59L, 60R; March, Adv. 10, 63R; May, Edit. 67L; Adv. 59; June, Edit. 72R; Adv 67, 71, 74L; July, Edit. 66R; Adv. 15; Aug., Adv. 10, 59R, 62L; Sept., Adv. 60L, 64L; Oct., Edit. 58L, 62L; Adv. 8, 11, 70L; Nov., Edit. 62R, 64R, 65; Adv. 43, 66L; Dec., Edit. 58L, 65, 66L, 70L

variable speed, Jan., Adv. 3; Feb., Edit. 27L, 30, 31, 32, 33; Adv., 11, 63; March, Edit. 28L; March, Adv. 56L; April, Adv. 43, 63; May, Edit. 58R, 60R; Adv. 15, 71; June, Adv. 9; July, Adv. 61R; Aug., Edit. 58; Adv. 13; Sept., Adv. 54L, 57; Oct., Edit. 62L; Adv. 13; Nov., Adv. 13, 65; Dec., Adv. 13

V-belts, March, Edit. 28L; July, Edit. 68R; Adv. 12; Aug., Edit. 16L; Sept., Edit. 47; Nov., Adv. 45; Dec., Edit. 58R; Adv. 49

Electronic equipment, March, Edit. 45L, 55L, 56R; April, Edit. 60R; Aug., Edit. 48, 54R, 56R; Dec., Edit. 50L

Engines, Aug., Edit. 25, 26

Fans, Oct., Edit. 16, 17L, 23R, 24L

Fastenings,

differential screws, March, Edit. 21L; April, Edit. 25, 26, 27

lock washers, Jan., Adv. 54L; March, Adv. 57R; May, Adv. 54L; July, Adv. 65R; Sept., Adv. 63R; Nov., Adv. 60L

nuts, March, Edit. 21R

screws, Jan., Adv. 65R; March, Adv. 62; April, Adv. 62; May, Adv. 70; July, Adv. 59; Sept., Edit. 57; Dec., Edit. 64R

setscrews, Jan., Adv. 58L; Feb., Adv. 62; March, Adv. 55R; May, Adv. 60L; July, Adv. 69R; Sept., Adv. 55R; Nov., Adv. 58L

washers, Nov., Edit. 65R, 66R

Filters, Dec., Edit. 58

Flexible shafts, Feb., Edit. 18R

Forgings, May, Adv. 60L; July, Adv. 68L

Gages, Feb., Adv. 59R; March, Edit. 52R, 53L; Adv. 61R; April, Adv. 61R; June, Edit. 70R, 72R, 74R; Aug., Adv. 61R; Nov., Adv. 69R

Gears, Feb., Edit. 61L; March, Edit. 27R, 28L; April, Edit. 20; May, Edit. 21, 22; Adv. 59; June, Edit. 33, 34, 40-45, 53-62, 89R; Adv. 2, 86L; July, Edit. 22, 33-37, 44-61; Sept., Edit. 22, 27R, 43R, 44; Oct., Edit. 26, 27, 28, 67L; Nov., Edit. 20R, 21L, 29R, 30L, 48; Dec., Edit. 29L

Heating units, July, Edit. 18L, 19

Hose, Aug., Edit. 59L

Hydraulic equipment, Feb., Edit. 50R, 52R, 54R; July, Edit. 19; Dec., Edit. 28, 29, 30

Lubrication and lubricating equipment,

design, Jan., Edit. 15R; Feb., Edit. 14, 16; March, Edit 28R; June, Edit. 44L; July, Edit. 18L, 28, 29L, 44R, 46L; Aug., Edit. 17L, 22, 23, 24; Oct., Edit. 24R, 31, 32; Nov., Edit. 30L; Dec., Edit. 16, 17, 18, 19

general, March, Edit. 40

pumps, Feb., Edit. 46R

standards, March, Edit. 41L

systems, May, Adv. 61; July, Adv. 55; Aug., Edit. 50R, 52R; Sept., Adv. 9; Oct., Adv. 53; Nov., Edit. 64R, 65L; Adv.. 74

Micrometer heads, Oct., Edit. 58

Motors,

*See also under Drives; motorized reducers*

building in, Feb., Edit. 15, 18R; March, Edit. 31L; May, Adv. 16, 17; Sept., Edit. 19R, 20L, 31R; Oct., Edit. 22, 23, 24, 25; Nov., Edit. 20R, 21L, 30L; Dec., Edit. 20R

capacitor, Jan., Edit. 54R, 56R; March, Edit. 54R; June, Edit. 70; Sept., Adv., 58L; Oct., Edit. 17

design, March, Edit. 19, 20L

flange head, June, Edit. 76R

fractional horsepower, Jan., Edit. 50R, 52R; Feb., Edit. 15, 50; Adv. 53; May, Adv. 57, 64L; June, Adv. 88L; July, Edit. 67L, 68R; Adv. 57; Sept., Adv. 56L; Oct., Adv. 66L; Nov., Adv. 10, 64L, 66L, 68L

general, Jan., Adv. 11, 64L; Feb., Adv. 3, 54L, 56L, 58L; March, Adv. 3, 51, 60L; April, Adv. 8, 9, 53, 58L; May, Edit. 66R, 67L; Adv. 8, 51, 63, 67R, 72L; June, Adv. 20; July, Adv. 10, 53, 60L, 62L, 72L; Aug., Adv. 55; Sept. Adv. 11; Oct., Edit. 64R, 65L; Adv. 45, 59, 72L, 74; Nov., Adv. 14, 53; Dec., Adv. 8, 11, 55

hydraulic, Jan., Edit. 20, 21, 22, 23; Feb., Edit. 50R, 52R; Dec., Edit. 30L

multispeed, Feb., Edit. 30, 31, 32

protected, Feb., Edit. 56R, 58R; March, Edit. 50R; Adv. 10, 59R; April, Edit. 54R; Adv. 66, 67; June, Adv. 71; Aug., Edit. 16, 17, 47R, 48L; Oct., Edit. 60; Nov., Edit. 67L; Adv. 55

variable speed, Feb., Edit. 30, 31, 32

Packing glands and packing, Jan., Edit. 40R; Adv. 4; Feb., Adv. 4, 55; March, Edit. 62, 63L; Adv. 4; April, Edit. 58R; Adv. 4, 48L; May, Adv. 4; June, Edit. 24R, 25, 80R, 82R; Adv. 4, 81; July, Adv. 4; Aug., 17, 18, 22, 23, 24; Adv. 4, 56L; Sept., Edit. 44R, 46L; Adv. 4; Oct., Edit. 41R, 42; Adv. 4, 71R; Nov., Edit. 60R, 62R; Adv. 4, 9; Dec., Edit. 29R; Adv. 4

Plates, April, Adv. 51

Plugs (Electrical), Feb., Adv. 2; May, Adv. 65; June, Adv. 22; Sept., Adv. 8; Oct., Adv. 55; Nov., Adv. 51

Pumps,

acid, June, Edit. 25, 80R, 82R

coolant, Feb., Adv. 60L; March, Adv. 60L, 64L; July, Adv. 62L; Sept., Adv. 62L; Dec., Adv. 72L

general, Jan., Adv. 62L, 64L; April, Adv. 64L; May, Edit. 19, 20L; Oct., Adv. 68L; Dec., Edit. 64R; Adv. 70L

hydraulic, Jan., Edit. 60; Adv. 56L; Feb., Edit. 50R, 52R; Adv. 64L; May, Adv. 64L; Sept., Adv. 58L; Oct., Adv. 64L, Nov., Edit. 66R, 67L; Adv. 72L; Dec., Edit. 29L

lubricant, Feb., Edit. 46R; Sept., Adv. 60L; Nov., Adv. 66L; Dec., Edit. 18

rotary, April, Adv. 56L; May, Adv. 62L, 72L; June, Adv. 84L; July, Adv. 68L, 72L; Oct., Adv. 66L; Nov., Edit. 19R, 20L; Adv. 70L; Dec., Adv. 68L

Pyrometers, April, Edit. 50R, 52R

Recorders, Sept., Edit. 61L

Regulators, April, Edit. 58R, 59L

Shafting, July, Edit. 31

Shapes, April, Adv. 14; May, Adv. 47; June, Adv. 63; July, Adv. 13; Aug., Adv. 51; Sept., Adv. 53; Oct., Edit. 20R, 21L; Adv. 49

Sheets, Oct., Edit. 35R, 36L; Dec., Edit. 22, 23, 24

Sheets (Prefinished), Nov., Edit. 27

Shims, April, Adv. 60L; May, Adv. 62L; June, Adv. 86L; July, Adv. 64L; Aug., Adv. 58L; Sept., Adv. 62L; Oct., Adv. 64L; Nov., Adv. 64L; Dec., Adv. 66L

Springs, Jan., Edit. 13, 14, 15L, 16L; Adv. 12; Feb., Edit. 14, 15, 16L; Adv. 45; March, Adv. 47; April, Edit. 16R; Adv. 57; May, Edit. 20, 25R, 26L, 34, 35; Adv. 18; June, Edit. 27, 31, 32, 49R, 82R; Adv. 11; July, Edit. 21R, 22L, 23, 64R; Adv. 49; Aug., Adv. 14; Sept., Adv. 13; Oct., Edit. 18; Adv. 10; Nov., Edit. 29, 41R, 42L; Adv. 8; Dec., Edit. 36, 47L; Adv. 10

Stampings, April, Adv. 52; May, Adv. 58

Steel balls, Feb., Edit. 46R; March, Edit. 40R, 41L

Steel cable, Aug., Edit. 16R, 17, 18

Steel plates, May, Adv. 53

Tubes, Feb., Edit. 16R, 26L; Nov., Edit. 21R

Turbines, Dec., Edit. 29R, 30L

Universal joints, Jan., Edit. 15R, 16L; Dec., Edit. 35R, 36L

Valves, Jan., Edit. 26; Feb., Edit. 37; March, Edit. 20R, 21L, 34, 45R; April, Edit. 18R, 46R, 48R; May, Edit. 20R, 21L; June, Edit. 26R, 27L, 70L; July, Edit. 23L; Aug., Edit. 18R, 48R; Sept., Edit. 20R, 21L; Oct., Edit. 60L; Dec., Edit. 21L, 48L

Welded parts and equipment,

- design, Jan., Edit. 15R; Feb., Adv. 43; July, Edit. 19R, 43R; Adv. 16; Aug., Edit. 16, 17; Sept., Adv. 10; Oct., Edit. 36; Adv. 61; Nov., Edit. 20, 30R; Adv. 61; Dec., Edit. 24L, 52L; Adv. 63
- electrodes and rods, Jan., Edit. 54R; May, Edit. 60R, 62R, 64R; July, Edit. 66R; Aug., Edit. 50L; Oct., Edit. 62
- machines and processes, Feb., Edit. 24, 25, 26, 27; Adv. 67; May, Edit. 67L; Adv. 13; Aug., Edit. 56R, 58R; Adv. 67; Oct., Edit. 66R; Adv. 75; Nov., Edit. 21L; Dec., Edit. 60R, 62R, 64R, 66L; Adv. 75
- standards, March, Edit. 40R
- systems, March, Adv. 8; April, Adv. 47; June, Adv. 3, 77; Aug., Adv. 8

Wire, Oct., Edit. 62R, 64R

**Principles:**

Centrifugal, Jan., Edit. 15R, 16R; Feb., Edit. 13, 14, 15, 16; March, Edit. 63L; May, Edit. 24R, 25L; June, Edit. 50L; July, Edit. 19L, 62R; Aug., Edit. 20R, 21L; Sept., Edit. 22, 43R, 44; Dec., Edit. 18R

Hydraulic, Jan., Edit. 20, 21, 22, 23; Feb., Edit. 25R, 46; March, Edit. 20; April, Edit. 19, 20L; Sept., Edit. 23, 37, 38L; Oct., Edit. 41; Dec., Edit. 28, 29, 30, 36L

Inertia, Nov., Edit. 41R, 42L

Magnetic, Jan., Edit. 18; April Edit. 21L; July, Edit. 23L; Aug., Edit. 46

Vacuum, Jan., Edit. 33, 34, 35; April, Edit. 24R; May, Edit. 20L, 45R, 56L; Dec., Edit. 46

**Production:**

Ceramic parts, designing for, June, Edit. 23, 24, 25, 80R, 82R

Chromium plating, specifying, July, Edit. 30, 31, 32

Clamping, securing high pressure, July, Edit. 21

Cost determination, Feb., Edit. 23

External broaching, designing for, Feb., Edit. 28, 29

Interior surfaces, grinding, May, Edit. 25L

Shrink fits, simplifying, Aug., Edit. 20

Simplifying, Jan., Edit. 33, 34, 35

**Sales and Sales Department:**

Appearance, improving, Feb., Edit. 17, 18R, 19L; March, Edit. 22, 23, 24, 25; April, Edit. 22, 23, 24; May, Edit. 19, 22; Sept., Edit. 19; Nov., Edit. 19, 28, 29, 30

Engineering department, relation to, May, Edit. 30

Increasing, by considering operators, March, Edit. 30, 31, 32, 45

Markets, finding, Sept., Edit. 31, 32

Sales value, protecting, Nov., Edit. 15, 16, 17, 18, 69L

**Standardization:**

Activities in, April, Edit. 39L

Bearings, simplified practice, Sept., Edit. 42R, 46R

Classification of lubricants, March, Edit. 41L

Drawing and drafting room practice, Aug., Edit. 27, 28

Importance of, Sept., Edit. 41L

Listing of standards, Jan., Edit. 28R

Pressure and vacuum gages, Dec., Edit. 52R, 54L

Standard units, combining, Nov., Edit. 30

Tapered roller bearings, Oct., Edit. 44

Welding equipment, March, Edit. 40R